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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOACHIM WOLF and ANDREAS KAMMANN

Appeal 2009-002322
Application 10/627,080
Technology Center 3600

Decided: September 25, 2009

Before WILLIAM F. PATE, III, STEVEN D.A. McCARTHY
and KEN B. BARRETT, *Administrative Patent Judges*.

McCARTHY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

1
2 The Appellants appeal under 35 U.S.C. § 134 (2002) from the
3 Examiner's decision finally rejecting claims 1-3 and 9-12 under 35 U.S.C.
4 § 103(a) (2002) as being unpatentable over Baker (US 4,936,811, issued Jun.
5 26, 1990) and Devers (US 6,672,596 B2, issued Jan. 6, 2004); finally

1 rejecting claims 13 and 15 under § 103(a) as being unpatentable over Takeda
2 (JP 56-62464, issued Oct. 19, 1979)¹ and the Examiner's Official Notice
3 finding that "it is well known to one of ordinary skill in the art to use a rivet
4 as a means to connect two pieces" (Ans. 4); and finally rejecting claims 16-
5 19 under § 103(a) as being unpatentable over Takeda and Devers. The
6 Examiner objects to claim 6 but indicates that the subject matter of the claim
7 is allowable. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

8 We AFFIRM.

9 The claims on appeal relate to axle boots for sealing joints in motor
10 vehicle drive trains. (Spec. 1, ¶ 0002). Claim 1 is typical of the claims on
11 appeal:

12
13 1. An axle boot for joint sealing, comprising:

14 a joint housing including an external contour
15 having a plurality of radial recesses;

16 a substantially axisymmetric bellows
17 including an integral connecting collar formed as a
18 single piece, the connecting collar including a
19 plurality of indentations projecting radially inward,
20 each indentation adapted to one of the radial
21 recesses;

22 a plurality of compensating pieces
23 connected to one another by a plurality of ring
24 sections to form a single piece component
25 surrounding an outer circumference of the
26 connecting collar, the single piece component
27 having a cylindrical outer circumferential surface,
28 wherein at least one of the ring sections is
29 elastically deformable sufficient to enable the

¹ Page citations to Takeda will be to an English-language translation entered in the record of the underlying application.

single piece component to expand to a
circumference larger than the outer circumference
of the connecting collar; and

a circumferential clamp surrounding and
contacting the single piece component.

ISSUES

The Appellants argue claims 1-3 and 10-12 as a group for purposes of the rejection of those claims under § 103(a). (App. Br. 9-11; Reply Br. 2). Claim 1 is representative of the group. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2008). The Examiner finds that Baker discloses each limitation of claim 1 except at least one ring section sufficiently elastically deformable to enable the single piece component to expand to a circumference larger than the outer circumference of the connecting collar. (Ans. 3). The Examiner concludes that “it would have been obvious . . . to modify the compensating component of Baker with the unified component taught by Devers to provide a more uniform sealing and clamping force.” (Ans. 3-4). The Appellants contend that one of ordinary skill in the art would have had no reason to connect the individual segmented band segments disclosed by Baker in an elastically deformable manner, and that Baker teaches away from elastically deformable solutions. (App. Br. 10; Reply Br. 2).

Two issues arising in this appeal are:

Have the Appellants shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring sections forming a single piece

1 component, the ring sections being elastically deformable
2 sufficient to enable the single piece component to expand to a
3 circumference larger than the outer circumference of an integral
4 connecting collar of a bellows?

5 Have the Appellants shown that the Examiner erred in
6 concluding that Baker and Devers would have provided one of
7 ordinary skill in the art reason to incorporate into an axle boot
8 ring sections forming a single piece component, the ring
9 sections being elastically deformable sufficient to enable the
10 single piece component to expand to a circumference larger
11 than the outer circumference of an integral connecting collar of
12 a bellows because Baker teaches away from such a
13 combination?

14 The Appellants argue the rejection of claim 9 separately, contending
15 that neither Baker nor Devers discloses “each compensating piece
16 includ[ing] . . . more than one material component, each of the material
17 components having a different hardness.” (App. Br. 11). The Examiner
18 responds that Figures 1, 2 and 4 of Devers depict compensating pieces
19 including wall segments and inserts of different materials having different
20 hardnesses. (Ans. 6-7).

21 Another issue arising in this appeal is:

22 Have the Appellants shown that the Examiner failed to
23 articulate reasoning with some rational underpinning sufficient
24 to support the conclusion that Baker and Devers would have
25 provided one of ordinary skill in the art reason to incorporate
26 into an axle boot ring a plurality of compensating pieces, each

1 compensating piece including more than one material
2 component, and each material component having a different
3 hardness?

4 The Appellants also argue claims 13 and 15 separately. The
5 Appellants contend that Takeda fails to disclose either connecting the
6 plurality of compensating pieces to a clamp using at least one rivet as recited
7 in claim 13, or the limitation separately recited in claim 15, namely, that a
8 circumferential length of each of the plurality of compensating pieces
9 corresponds approximately to a circumferential length of an associated radial
10 recess in the joint housing. (App. Br. 12). The Examiner concludes that it
11 would have been obvious to use a rivet to connect a compensating piece to
12 the collar. The Examiner finds that Takeda discloses the limitation
13 separately recited in claim 15. (Ans. 4).

14 Two more issues arising in this appeal are:

15 Have the Appellants shown that the Examiner failed to
16 articulate reasoning with some rational underpinning sufficient
17 to support the conclusion that Takeda and the fact taken by
18 Official Notice would have provided one of ordinary skill in the
19 art reason to incorporate into an axle boot ring a plurality of
20 compensating pieces connected to a clamp using at least one
21 rivet?

22 Have the Appellants shown that the Examiner erred in
23 finding that Takeda discloses an axle boot ring including a
24 plurality of compensating pieces, a circumferential length of
25 each of the compensating pieces corresponding approximately

1 to a circumferential length of an associated radial recess in a
2 joint housing?

3 The Appellants argue claims 16-19 separately for purposes of the
4 rejection of the claim under § 103(a). The Appellants contend, with respect
5 to each of claims 16-19, that the combined teachings of Takeda and Devers
6 would have provided one of ordinary skill in the art no reason to modify a
7 boot of the type disclosed by Takeda so as to meet the limitations of each
8 claim. (App. Br. 13). The Appellants contend that Devers does not disclose
9 compensating pieces having radial supporting webs. (*Id.*) The Examiner
10 concludes that it would have been obvious to modify the boot of Takeda in
11 view of Devers “to provide a more uniform sealing and clamping force.”
12 (Ans. 4-5).

13 Two more issues arising in this appeal are:

14 Have the Appellants shown that the Examiner erred in
15 finding that Devers discloses an axle boot including a plurality
16 of compensating pieces, each of which includes at least one
17 radial supporting web?

18 Have the Appellants shown that the Examiner failed to
19 articulate reasoning with some rational underpinning sufficient
20 to support the conclusion that Takeda, Devers and the fact taken
21 by Official Notice would have provided one of ordinary skill in
22 the art reason to incorporate the limitations separately recited in
23 each of claims 16-19 into an axle boot, as recited in
24 independent claim 13?
25

FINDINGS OF FACT

The record supports the following findings of fact (“FF”) by a preponderance of the evidence.

1. Baker discloses a tripot constant velocity [“CV”] joint *10* including a joint housing *16*. Baker’s housing *16* has three axially extending lobes *16a* separated by axially extending, generally concave depressions *16b*. (Baker, col. 3, ll. 27-30).

2. Baker’s CV joint *10* also includes a convoluted, flexible polymeric boot or bellows *12*. (Baker, col. 3, ll. 35-39). Figures 1-3 of Baker depict the boot *12* as being substantially axisymmetric.

3. The boot *12* has at its larger end *14* a sleeve *15*. (Baker, col. 3, ll. 35-39). Figure 2 of Baker depicts the boot *12* as being formed as a single piece including the sleeve *15*, which is integral with the remainder of the boot *12*.

4. Baker’s CV joint also includes a three-piece segmental band *22*. (Baker, col. 3, ll. 39-42). Baker’s three-piece segmental band *22* has an outer contour which forms a circle, and an inner contour sized and configured to encircle the outside of the joint housing *16* and the correspondingly shaped sleeve *15* of the boot *12*. (Baker, col. 4, ll. 4-8). Baker’s three-piece segmental band *22* consists of three segmented band sections *30* connected at their longitudinal ends by complementary tongues *34* and grooves *36* to form a single piece component *22*. (Baker, col. 4, ll. 14-16).

5. Baker’s CV joint also includes a low profile clamp *23* which encircles the sleeve *15* to cause the boot *12* to grip the joint housing *16*. (Baker, col. 3, ll. 39-42). Figure 3 of Baker shows the low profile clamp *23*

1 seated in a clamp receiving slot or groove 37 in contact with the three-piece
2 segmental band 22.

3 6. Baker discloses injection molding the boot 12 from a
4 thermoplastic elastomer ["TPE"]. (Baker, col. 3, ll. 65-68). Baker also
5 discloses injection molding each of the segmented band sections 30 from the
6 same TPE. (Baker, col. 4, ll. 10-13).

7 7. Baker discloses slipping the sleeve 15 over the joint housing 16
8 during assembly. (Baker, col. 4, ll. 27-31). The three-piece segmental band
9 22 is fitted over the sleeve 15 of the boot 12 after the sleeve 15 is slipped
10 over the joint housing 16. (Baker, col. 4, ll. 31-34).

11 8. Baker criticizes a prior art joint structure including a TPE filler
12 ring placed between the joint housing and the convoluted boot or bellows.
13 Baker teaches that this arrangement forces the clamp to compress a more
14 rigid material, namely, the material of the convoluted boot, down on a more
15 flexible material, namely, the TPE of the filler ring. (Baker, col. 2, ll. 22-
16 35).

17 9. Baker teaches forming the segmented band sections 30 from the
18 same TPE used to mold the boot 12. Baker also teaches connecting the
19 sections 30 by means of the complementary tongues 34 and grooves 36 so as
20 to allow the individual sections to move freely in a circumferential direction
21 into alignment with the depressions 16b of the housing 16. As a result of
22 these features, Baker's three-piece segmental band 22 effectively transmits
23 the clamping force imposed by the low profile clamp 23 to the boot 12.
24 (Baker, col. 2, ll. 63-68).

25 10. Devers discloses a tripot universal joint 10 including a joint
26 housing 12. (Devers, col. 2, ll. 62-63). Devers' joint housing 12 includes

three circumferentially spaced and longitudinally extending drive channels 18. The joint housing 12 also includes three outer wall spaces 34 defined by surfaces 34a-34c between each of the drive channels 18. (Devers, col. 3, ll. 1-15). Figure 2 of Devers depicts the surfaces 34a-34c as collectively defining radial recesses in the external contour of the joint housing 12. Devers' universal joint 10 also includes a boot seal or bellows 38. (Devers, col. 3, ll. 36-38). Figures 1 and 2 of Devers depict the boot seal 38 as being axisymmetric.

11. Figure 1 depicts the boot seal 38 as being formed in a single piece including an integral connecting collar. Figure 2 of Devers depicts the integral connecting collar as fitting over a seal adapter 40 of the universal joint 10.

12. Devers' seal adapter 40 includes an annular body 41. The annular body 41 includes spaced wall inner segments 42a-42c shaped to conform against the surfaces 34a-34c which define the radial recesses in the external contour of the joint housing 12. The annular body 41 also includes thin outer wall sections 42d-42f aligned with the spaced wall inner segments 42a-42c to define pockets 43. The outer wall sections 42d-42f are connected by wall segments 42g-42i of the same radius. (Devers, col. 3, ll. 39-50). Figure 2 of Devers depicts the wall sections or segments 42d-42i as forming a continuous, cylindrical outer circumferential surface.

13. Devers discloses a trapezoidal, cup-like plastic insert 70 (71) having a radial supporting rib or web 72 filling each pocket 43 in the seal adapter 40. (Devers, col. 3, ll. 50-55 and 57-58; figs. 7 and 8). The insert 70 (71) is made from a polymeric material more rigid than the material from

1 which the wall segments or sections 42a-42i are made. (Devers, col. 3, l. 66
2 – col. 4, l. 5).

3 14. The spaced wall inner segments 42a-42c, the outer wall
4 sections 42d-42f, and the inserts 70 (71) together form hollow (that is, air-
5 filled) bodies. Since the inserts 70 (71) are made from a polymeric material
6 more rigid than the material from which the wall segments or sections 42a-
7 42f are made, the wall segments or sections 42a-42f are flexible in
8 comparison to the inserts 70 (71).

9 15. Devers' universal joint includes a clamp ring 48 at the end of
10 the boot seal 38. (Devers, col. 3, ll. 36-38 and fig. 1). Figure 2 of Devers
11 depicts the clamp ring 48 clamping the boot seal 38 over the seal adapter 40.

12 16. Devers describes the seal adapter 40 as having enough pliability
13 to be pulled over an end 12a of the joint housing 12 during assembly of the
14 universal joint 10. (Devers, col. 4, ll. 10-15).

15 17. Devers teaches that the inserts 70 (71) reinforce the portions of
16 the seal adapter 40 that fill the outer wall spaces 34 of the housing 12.
17 Devers further teaches that the insert 70 (71) is supported within the pockets
18 43 of the seal adapter 40 for providing a load transfer path from the seal boot
19 38 to the housing member 12. Devers teaches that the reinforced seal
20 adapter 40 provides nearly uniform compression between the clamped seal
21 boot 38 and the joint housing 12 despite the non-uniform configuration of
22 the joint housing. (See Devers, col. 2, ll. 1-19).

23 18. Takeda describes a boot 24 attached to an outer member 21
24 which houses the parts of a universal joint. (See Takeda 2, l. 8 and 5, ll. 11-
25 15). The periphery of the outer member 21 is formed into a non-circular
26 shape that comprises convex surface parts 22 and concave surface parts 23

1 that are recessed radially inwardly from the contour lines of convex surface
2 parts 22. (See Takeda 5, Il. 9-11).

3 19. Takeda discloses a band or circumferential clamp 27 used to
4 tighten the boot 24 to the outer member 21. (Takeda 5, Il. 18-21).

5 20. Takeda's circumferential clamp includes bulged parts or
6 compensating pieces 28 having inwardly convex-surface-like shapes. (*Id.*)
7 Figure 6(C) of Takeda depicts these bulged parts 28 as being connected to
8 the band 27 in an integrated multi-component unit.

9 21. Figures 6(A) and 6(C) depict the lengths of the bulged parts 28
10 corresponding approximately to the lengths of the concave surface parts 23
11 formed on the outer member 21. Defining the length of a concave surface
12 part as the length of the circular arc connecting the two edges of each
13 concave surface part 23 as shown on the left side of Figure 6(A), the length
14 of the bulged part 28 shown in figure 6(C) is approximately equal to the
15 length of the associated concave surface part 23 shown in Figure 6(A).

16 22. The Examiner takes Official Notice that it is well known to one
17 of ordinary skill in the art to use a rivet as a means to connect two pieces.
18 (Ans. 4). The Appellants do not appear to dispute this fact. (See, e.g., App.
19 Br. 13).

20 21 PRINCIPLES OF LAW

22 A claim under examination is given its broadest reasonable
23 interpretation consistent with the underlying specification. *In re Am. Acad.*
24 *of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). In the absence of
25 an express definition of a claim term in the specification, the claim term is
26 given its broadest reasonable meaning in its ordinary usage as the term

1 would be understood by one of ordinary skill in the art. *In re ICON Health*
2 & Fitness, Inc., 496 F.3d 1374, 1379 (Fed. Cir. 2007); *In re Morris*, 127
3 F.3d 1048, 1054 (Fed. Cir. 1997). Properties of preferred embodiments
4 described in the specification which are not recited in a claim do not limit
5 the reasonable scope of the claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343
6 F.3d 1364, 1369 (Fed. Cir. 2003).

7 “[W]hen a patent claims a structure already known in the art that is
8 altered by the mere substitution of one element for another known in the
9 field, the combination must do more than yield a predictable result” to be
10 non-obvious under § 103(a). *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398,
11 416 (2007). Similarly, “if a technique has been used to improve one device,
12 and a person of ordinary skill in the art would recognize that it would
13 improve similar devices in the same way, using the techniques is obvious
14 unless its application is beyond his or her skill.” *Id.* at 417.

15 As a general rule, a reference which “teaches away” from the subject
16 matter of a claim does not support a prima facie case that the subject matter
17 would have been obvious. A reference teaches away from the subject matter
18 of a claim only if “a person of ordinary skill, upon reading the reference,
19 would be discouraged from following the path set out in the reference, or
20 would be led in a direction divergent from the path that was taken by the
21 applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Prior art does
22 not teach away from claimed subject matter merely by disclosing a different
23 solution to a similar problem unless the prior art also criticizes, discredits or
24 otherwise discourages the solution claimed. *See In re Fulton*, 391 F.3d
25 1195, 1201 (Fed. Cir. 2004).

ANALYSIS

Turning to the rejection of claim 1, Baker and Devers disclose tripot joints which are similar in structure and function. For example, both Baker's CV joint and Devers' universal joint include joint housings with external contours having three radial recesses. (See FF 1 and 12). Both Baker's CV joint and Devers' universal joint include substantially axisymmetric bellows with integral connecting collars formed as single pieces. (See FF 2, 3 and 11). Finally, both Baker's CV joint and Devers' universal joint include circumferential clamps surrounding and contacting the components. (FF 5 and 15).

Devers' seal adapter 40 is structurally similar to Baker's segmented band 22. For example, both Devers' seal adapter, which is pliable (FF 16), and Baker's segmented band, which consists of segmented band segments connected by tongue-and-groove connections (FF 4), share the property that annular portions may shift slightly relative to each other to permit more uniform transmission of forces from the clamp through the bellows to the joint housing. This structural similarity is present even if Baker's segmented band 22 fits over Baker's boot 12 (see FF 4), and Devers' seal adapter 40 fits within the boot seal 38 (see FF 11) in the particular embodiments described in those references. Devers' seal adapter 40 and Baker's segmented band 22 perform related functions. Both Devers' seal adapter 40 and Baker's segmented band 22 define inner contours corresponding to the external contours of their corresponding joint housings. (FF 4 and 12). Both Devers' seal adapter 40 and Baker's segmented band 22 define cylindrical outer circumferential surfaces (*id.*) for evenly receiving and transmitting compressive forces from the circumferential clamps.

1 Since Baker and Devers describe similar devices, it would have been
2 obvious to substitute a seal adapter similar to the seal adapter 40 described
3 by Devers (*see* FF 12 and 13) positioned over the boot seal or bellows for
4 the three-piece segmental band 22 disclosed by Baker in a CV joint of the
5 type described by Baker. This may be viewed either as a simple substitution
6 of one known component for another or as the application of an
7 improvement known from the teachings of Devers to the similar joint
8 disclosed by Baker. The Appellants have not provided any evidence or
9 argument sufficient to show that such a substitution or improvement would
10 have been beyond the level of ordinary skill in the art. Neither have the
11 Appellants provided any evidence or argument sufficient to show that the
12 proposed substitution or improvement would have been more than a
13 predictable use of the prior art elements according to their established
14 functions.

15 Baker discloses slipping the sleeve of the boot over the joint housing
16 and then fitting the three-piece segmental band over the sleeve after the
17 sleeve is slipped over the joint housing. (*See* FF 7). Devers describes the
18 seal adapter as having enough pliability to be pulled over an end of the joint
19 housing during assembly of the universal joint. (FF 16). Given the
20 similarity between the joints described by Baker and Devers, it would have
21 been obvious to assemble a tripot joint by slipping the sleeve of a boot seal
22 or bellows over the joint housing and then pulling an adapter of the type
23 disclosed by Devers into place over the sleeve.

24 One of ordinary skill in the art would have sufficient problem-solving
25 skills to provide the adapter sufficient pliability or elastic deformability to
26 enable the adapter (which would be a single piece component) to expand to a

1 circumference larger than the outer circumference of the structure, namely,
2 the connecting collar or sleeve of the bellows, over which the adapter is to
3 be pulled. Since Devers already describes a pliable seal adapter, providing
4 an adapter with sufficient elastic deformability to enable the adapter to
5 expand to fit over the sleeve would have been within the level of ordinary
6 skill in the art. The Appellants provide no evidence or argument sufficient
7 to show that the proposed assembly process and modification of the adapter
8 would have been more than a predictable use of prior art elements.

9 Baker does not teach away from these proposed substitutions,
10 improvements and modifications merely by disclosing the use of segmented
11 band sections interconnected by tongues and grooves rather than a pliable
12 adapter with inserts made from a material in order to permit more uniform
13 transmission of force from the clamp through the sleeve of the bellows to the
14 joint housing. Baker criticizes a prior art arrangement using a pliable
15 adapter or filler ring placed *between* the sleeve of the bellows and the
16 housing. (FF 8). Baker does not criticize or disparage the use of a pliable
17 adapter positioned *over both* the bellows and the housing. Baker does not
18 teach away from the proposed substitutions, improvements and
19 modifications merely because Baker teaches a different solution to a related
20 problem.

21 Turning to the rejection of claim 9, Devers' seal adapter 40 includes
22 spaced wall inner segments 42a-42c shaped to conform against the surfaces
23 34a-34c which define the radial recesses in the external contour of the joint
24 housing 12; thin outer wall sections 42d-42f aligned with the spaced wall
25 inner segments 42a-42c to define pockets 43; and trapezoidal, cup-like
26 plastic inserts 70 (71) filling the pockets 43. (FF 12 and 13). The inserts 70

(71) are made from a polymeric material more rigid than the material from which the wall segments or sections 42a-42i are made. (FF 13). Devers teaches that the inserts 70 (71) reinforce the portions of the seal adapter 40 that fill the outer wall spaces 34 of the housing 12, and that the reinforced seal adapter 40 provides nearly uniform compression between the clamped seal boot 38 and the joint housing 12 despite the non-uniform configuration of the joint housing. (FF 17).

One of ordinary skill in the art substituting a seal adapter similar to the seal adapter 40 described by Devers positioned over the sleeve of the boot seal or bellows for the three-piece segmental band disclosed by Baker would have had reason to substitute a seal adapter having spaced inner wall segments and inserts made from a polymeric material more rigid than the material from which the wall inner segments are made. As the Examiner points out, the arrangement would have provided a more uniform sealing and clamping force on the bellows and the joint housing. (See Ans. 3-4).

The Examiner interprets the term “compensating pieces” sufficiently broadly to encompass the combination of spaced inner wall segments and inserts made from a polymeric material more rigid than the material from which the wall inner segments are made. (See Ans. 6-7). The Appellants do not point out any definition of the term “compensating pieces” in the Specification or any ordinary usage of the term which would exclude the combination of the spaced inner wall segments and inserts from the scope of the term. The combined teachings of Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces, each compensating piece

1 including more than one material component and each material component
2 having a different hardness.

3 Turning to the rejection of claim 13, Takeda describes a boot attached
4 to an outer member or joint housing which houses the parts of a universal
5 joint. The periphery of the outer member includes inwardly recessed
6 concave surface parts. (FF 18). Takeda also discloses a band or
7 circumferential clamp 27 used to tighten the boot 24 to the outer member 21.
8 (FF 19). Takeda's circumferential clamp includes bulged parts or
9 compensating pieces 28 having inwardly convex-surface-like shapes.
10 Takeda depicts these bulged parts 28 as being connected to the band 27 in an
11 integrated multi-component unit. (FF 20).

12 Takeda does not disclose how the bulged parts are connected to the
13 band. The Examiner found, and the Appellants do not dispute, that it was
14 well known to one of ordinary skill in the art to use a rivet as a means to
15 connect two pieces. (FF 22). It would have been obvious to use at least one
16 rivet to connect each of the bulged parts or connecting pieces to the band.
17 Although the Appellants contend that the bulged parts disclosed by Takeda
18 do not appear to be rivetable to the band, the Appellants provide neither
19 evidence nor argument sufficient to show that connecting the bulged
20 portions to the band would have been beyond the level of ordinary skill in
21 the art. Neither have the Appellants provided any evidence or argument
22 sufficient to show that riveting the bulged parts to the band would have
23 involved more than a predictable use of prior art elements according to their
24 established functions. The Appellants have not shown that the Examiner
25 failed to articulate reasoning with some rational underpinning sufficient to
26 support the conclusion that Takeda and the fact taken by Official Notice

1 would have provided one of ordinary skill in the art reason to incorporate
2 into an axle boot ring a plurality of compensating pieces connected to a
3 clamp using at least one rivet.

4 Turning to the rejection of claim 15, the Examiner correctly found
5 (*see* Ans. 7-8) that the circumferential length of each of Takeda's bulged
6 portions or compensating pieces 28 corresponds approximately to a
7 circumferential length of an associated radial recess. (*See* FF 21). The
8 Appellants provide no evidence or argument sufficient to show that the
9 Examiner either interpreted the claim term "corresponds approximately"
10 unreasonably broadly or that the Examiner's finding is in error.

11 Turning to the rejections of claims 16-19, the Appellants contend that
12 Takeda and Devers fail to disclose each of the plurality of compensating
13 pieces including at least one radial web as recited in claim 19 (App. Br. 13),
14 but do not dispute the Examiner's findings that Takeda or Devers disclose
15 the limitations separately recited in claims 16-18 (*see id.*). The Examiner
16 correctly found (*see* Ans. 8) that Devers discloses compensating pieces.
17 Each of Devers' compensating pieces includes spaced wall inner segments
18 shaped to conform against radial recesses in the external contour of the joint
19 housing; thin outer wall sections aligned with the spaced wall inner
20 segments to define pockets; and cup-like plastic inserts having radial
21 supporting webs. (FF 12 and 13). That is, the Examiner correctly found
22 (*see* Ans. 8) that each of Devers' compensating pieces includes at least one
23 radial support web. (FF 13).

24 It would have been obvious to substitute compensating pieces of the
25 type disclosed by Devers, including spaced wall inner segments shaped to
26 conform against radial recesses in the external contour of the joint housing;

1 thin outer wall sections aligned with the spaced wall inner segments to
2 define pockets; and cup-like plastic inserts having radial supporting webs, in
3 place of the bulge parts disclosed by Takeda. To the extent that the mere
4 substitution of Devers' known compensating pieces for Takeda's bulge parts
5 in Takeda's known joint would not be obvious in and of itself, the
6 Appellants provide no reason why the Examiner's reasoning, namely, that
7 one of ordinary skill in the art would have had reason to make the
8 substitution to provide more uniform sealing and clamping forces (*see* Ans.
9 4-5), lacks rational underpinning or fails to support the conclusion that the
10 substitution would have been obvious.

11 Although the Appellants contend that the bulged parts disclosed by
12 Takeda do not appear to be rivetable to the band, the Appellants provide
13 neither evidence nor argument sufficient to show that riveting compensating
14 pieces of the type disclosed by Devers to a band of the type disclosed by
15 Takeda would have been beyond the level of ordinary skill in the art.
16 Neither have the Appellants provided any evidence or argument sufficient to
17 show that riveting compensating pieces of the type disclosed by Devers to
18 the band would have involved more than a predictable use of prior art
19 elements according to their established functions. In other words, the
20 Appellants have not shown that the Examiner failed to articulate reasoning
21 having rational underpinning sufficient to support the conclusion that the
22 subject matter of claims 16-19 would have been obvious.

23 24 CONCLUSIONS

25 The Appellants have not shown that the Examiner failed to articulate
26 reasoning with some rational underpinning sufficient to support the

1 conclusion that Baker and Devers would have provided one of ordinary skill
2 in the art reason to incorporate into an axle boot ring sections forming a
3 single piece component, the ring sections being elastically deformable
4 sufficient to enable the single piece component to expand to a circumference
5 larger than the outer circumference of an integral connecting collar of a
6 bellows.

7 The Appellants have not shown that the Examiner erred in concluding
8 that Baker and Devers would have provided one of ordinary skill in the art
9 reason to incorporate into an axle boot ring sections forming a single piece
10 component, the ring sections being elastically deformable sufficient to
11 enable the single piece component to expand to a circumference larger than
12 the outer circumference of an integral connecting collar of a bellows because
13 Baker teaches away from such a combination. Therefore, the Appellants
14 have not shown that the Examiner erred in rejecting claims 1-3 and 10-12
15 under § 103(a) as being unpatentable over Baker and Devers.

16 The Appellants have not shown that the Examiner failed to articulate
17 reasoning with some rational underpinning sufficient to support the
18 conclusion that Baker and Devers would have provided one of ordinary skill
19 in the art reason to incorporate into an axle boot ring a plurality of
20 compensating pieces, each compensating piece including more than one
21 material component and each material component having a different
22 hardness. Therefore, the Appellants have not shown that the Examiner erred
23 in rejecting claim 9 under § 103(a) as being unpatentable over Baker and
24 Devers.

25 The Appellants have not shown that the Examiner failed to articulate
26 reasoning with some rational underpinning sufficient to support the

1 conclusion that Takeda and the fact taken by Official Notice would have
2 provided one of ordinary skill in the art reason to incorporate into an axle
3 boot ring a plurality of compensating pieces connected to a clamp using at
4 least one rivet. Therefore, the Appellants have not shown that the Examiner
5 erred in rejecting claim 13 under § 103(a) as being unpatentable over Takeda
6 and the fact taken by Official Notice.

7 The Appellants have not shown that the Examiner erred in finding that
8 Takeda discloses an axle boot ring including a plurality of compensating
9 pieces, a circumferential length of each of the compensating pieces
10 corresponding approximately to a circumferential length of an associated
11 radial recess in a joint housing. Therefore, the Appellants have not shown
12 that the Examiner erred in rejecting claim 15 under § 103(a) as being
13 unpatentable over Takeda and the fact taken by Official Notice.

14 The Appellants have not shown that the Examiner erred in finding that
15 Devers discloses an axle boot including a plurality of compensating pieces,
16 each of which includes at least one radial supporting web.

17 The Appellants have not shown that the Examiner failed to articulate
18 reasoning with some rational underpinning sufficient to support the
19 conclusion that Takeda, Devers and the fact taken by Official Notice would
20 have provided one of ordinary skill in the art reason to incorporate the
21 limitations separately recited in each of claims 16-19 into an axle boot as
22 recited in independent claim 13. Therefore, the Appellants have not shown
23 that the Examiner erred in rejecting claims 16-19 under § 103(a) as being
24 unpatentable over Takeda, Devers and the fact taken by Official Notice.

DECISION

We AFFIRM the Examiner's decision rejecting claims 1-3, 9-13 and 15-19.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

mls

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